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THE
ONTARIO WATER RESOURCES
COMMISSION
WATER POLLUTION SURVEY
of the
VILLAGE OF OMEMEE
COUNTY OF VICTORIA

VILLAGE OF OMEMEE - 1964
COUNTY OF VICTORIA

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1964

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Report on a water pollution
survey of the village of Omemee
in the county of Victoria.

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THE
ONTARIO WATER RESOURCES
COMMISSION

REPORT

on a

WATER POLLUTION SURVEY

of the

VILLAGE OF OMEMEE

in the

COUNTY OF VICTORIA

Division of Sanitary Engineering

November 1964
January 1965

WATER POLLUTION SURVEY

of the

VILLAGE OF OMEMEE

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WATER POLLUTION SURVEY

of the

VILLAGE OF OMEMEE

INTRODUCTION

A water pollution survey of the Village of Omemee was performed on November 2 and 3, 1964. Due to the absence of various officials at that time, additional interviews were held on January 11, 1965. Surveys of this type are made by the Ontario Water Resources Commission in order to locate potential and existing sources of surface water pollution. In this instance, additional investigations were made pertaining to ground-water quality. Recommendations are made concerning the abatement of conditions which adversely affect water quality. Appended to this report is a map of Omemee showing the locations of sampling points within the village.

This survey was undertaken primarily at the request of local officials to determine the need for municipal water and sewage works.

INTERVIEWS WITH OFFICIALS

Discussions were held with the following officials during this survey:

Mr. G. Stephenson, Reeve;
Dr. J. Sobrian, Medical Officer of Health;
Mr. R. Pogue, Clerk.

VILLAGE OF OMEMEE

The Village of Omemee is located in the south-eastern part of the County of Victoria. The Pigeon River flows in a north-easterly direction through Omemee to empty into Pigeon Lake approximately four miles downstream from the village.

According to the 1964 Municipal Directory, the population of Omemee is approximately 817. The area of the village is approximately 398 acres.

WATER USES

Municipal

The Pigeon River is not utilized for municipal requirements in Omemee except to receive the flows from storm drainage systems. It is probable that the river would receive the effluent from any future public sewage works in Omemee.

Industrial

A dam is located at Omemee Elevators where river water is utilized for water power.

Recreational

A public bathing area is located on the west side of the Pigeon River north of the King Street (Highway 7) bridge.

WATER SUPPLY

Private wells are utilized in Omemee, as are private sewage disposal systems. When both services are located judiciously on a building lot where adequate area is provided and geological conditions are suitable, satisfactory results can be obtained. Reportedly, there are many premises in Omemee where the area of building lots is considerably less than the desirable minimum of 15,000 square feet for such purposes. The prevalence of clay soil and a high ground-water table has been reported. Well-drilling records on file with the Ground Water Branch of this Commission indicate a clay overburden, which in many instances is underlain by blue clay extending from approximately 15 feet to 60 feet. Many wells extend downward for approximately 60 feet where water is

drawn from a gravel stratum.

SURFACE WATER DRAINAGE

Surface drainage flows discharge either via ditches to the Pigeon River or to storm sewer systems which conduct these flows to the watercourse.

SEWAGE DISPOSAL FACILITIES

Private septic tank systems and privies are utilized. In some instances it is apparent that sanitary waste gains access to storm sewers and ditches. New sewage disposal installations are inspected by the Medical Officer of Health.

INDUSTRY

The principal industrial firms located in Omemee are listed as follows:

<u>Name of Firm</u>	<u>Product</u>
Omemee Elevators	Farm supplies
Regal Stationery Company Limited	Stationery
Shaw Research	Pharmaceutical supplies

Reportedly, none of the aforementioned firms have industrial waste flows which constitute a disposal problem.

PRIVATE OUTFALLS

Although no waste water outfalls extending from private premises to the river were revealed during this survey, it is possible that some are in existence.

MUNICIPAL REFUSE DISPOSAL SITE

The site utilized by the municipality for refuse disposal is located a short distance south of the village in the Township of Emily. The refuse material is deposited in a low-lying area near the north bank of the Pigeon River. Although this material is not placed on the immediate bank of the watercourse, it is quite

probable that leachate can drain from the site to the river. Reportedly, unsuccessful attempts have been made to obtain other property in order to relocate the refuse disposal site.

SAMPLING PROCEDURE

Water samples were obtained from 16 wells in order to determine the general trend in ground-water quality. Samples were collected from the waters of the Pigeon River at Omemee, as well as from outfalls discharging thereto within the corporation limits. The pertinent laboratory results are attached to this report in Tables I to III. The appended map showing the locations of sampling points is a reproduction of a plan obtained through the kindness of municipal officials. Although the original plan was prepared many years ago, the writer was assured that the copy obtained is reliable with respect to detail.

The stream and outfall samples were collected on November 3, 1964, when the atmospheric temperature was approximately 60 to 65 degrees Fahrenheit.

INTERPRETATION AND SIGNIFICANCE OF LABORATORY RESULTS

All of the laboratory tests were performed at the Ontario Water Resources Commission laboratory in Toronto, with the exception of the bacteriological examination of ground-water samples which were taken to the Peterborough Regional Laboratory of the Ontario Department of Health.

Ground-Water Samples

The analyses employed to determine the chemical quality of samples collected from six of the drinking water supplies were: hardness, alkalinity, iron, chloride, and pH.

Water samples were obtained from 16 private wells for

bacteriological examination. A water supply used for domestic requirements should not contain coliform organisms. The presence of 1 to 10 coliforms per 100 cubic centimeters of sample is cause for suspicion, while more than 10 coliforms per 100 cubic centimeters is considered to render the water unsafe for human consumption. The presence of coliform organisms indicates pollution from human or animal excrement, or from some non-faecal forms.

Stream and Outfall Samples

The analyses employed to determine the quality of these samples were: biochemical oxygen demand, (BOD), solids, anionic detergents as ABS, and the enumeration of coliform organisms.

The BOD of sewage, industrial wastes, or polluted waters, is the oxygen required during stabilization of the decomposable organic or chemical material by aerobic biochemical action. A five-day BOD determination with incubation at 20 degrees Centigrade is reported. A high BOD is indicative of organic or chemical pollution. The BOD of a watercourse should not exceed four parts per million (ppm).

The analyses for solids include tests for total, suspended, and dissolved solids. The results are reported in ppm. The first test measures both the solids in solution and in suspension. The suspended solids indicate the measure of undissolved solids of organic or inorganic nature in suspension. Land erosion, sewage, and industrial wastes, are significant sources of suspended solids. The effect of suspended solids in water is reflected in difficulties associated with water purification, and deposition in streams which could interfere with the habitat of aquatic life. The dissolved solids are a measure of those solids in solution.

The presence of anionic detergents as ABS is an indication that domestic waste is contained in the sample.

The Membrane Filter technique was used in the examination of these samples for the presence of coliforms. The coliforms are enumerated and reported per 100 millilitres (ml) of the sample. It is the opinion of the OWRC that the presence of coliforms in a water-course should not exceed 2,400 organisms per 100 ml of water.

SAMPLE RESULTS

The laboratory results are shown in appendices to this report as follows:

- Table I - Ground-Water Supplies
- Table II - Pigeon River
- Table III - Municipal Outfalls to Pigeon River in Omemee

Ground-Water Supplies

According to the laboratory results pertaining to the chemical analysis performed on samples obtained from six private wells in Omemee, the most outstanding characteristic is the high iron content in these ground-water supplies. The presence of iron in excess of 0.3 ppm can result in the objectionable staining of plumbing fixtures and the deposition of iron in pipes. If the concentration of iron exceeds 1.0 ppm, problems with metallic tastes might occur. It is the opinion of the OWRC that the iron content of a potable water supply should not exceed 0.3 ppm. If the results obtained at Omemee are representative of ground-water quality within the village, the high iron content might influence the type of treatment required if future municipal water works should rely on a ground-water supply.

Coliform organisms were revealed in the water samples obtained from six wells, or in 37 per cent of the wells sampled for bacteriological examination. It is apparent that contamination of the private water supplies is sufficiently prevalent to cause concern. The Medical Officer of Health reported on January 11, 1965,

that coliforms have been revealed in approximately 50 per cent of the wells which he has sampled within the village. He reported, however, that the problem has been most obvious in sections of the village where residential and commercial premises are most concentrated.

Pigeon River

The coliform content of the river water increased slightly as the watercourse flowed through Omemee. The absence of anionic detergents in the sample obtained from the river at the dam, as compared with a concentration of 0.1 ppm at the C.N.R. trestle downstream from the village, indicates the influence of sewage on the quality of the river water within the village.

Municipal Outfalls to Pigeon River in Omemee

Comments are made concerning these outlets where discharges were sampled during this survey:

Sample Point No. TP.145.42D

A municipal ditch extends along the west side of Sturgeon Street and conducts sewage flows to the Pigeon River.

Sample Point No. TP.145.41D

A municipal ditch terminates on the river bank at the east side of Sturgeon Street. Although this ditch was not observed during the initial part of the survey, attention was directed thereto on January 11, 1965. Icing conditions at that time prevented the obtaining of a representative sample. Reportedly, sewage flows gain access to the river via this ditch.

Sample Point No. TP.145.05W

A storm sewer extends along the south side of Highway 7 (King Street) and terminates near the west bank of the Pigeon River. The limited volume of flow discharging from this outlet permitted sampling for bacteriological examination only. The high coliform content confirms the visual observation that sewage was present in this discharge. It is probable that the sewers extending along King Street are the responsibility of the Department of Highways.

Sample Point No. TP.145.02W

A storm sewer serving the north side of Highway 7 has its outlet near the west bank of the river downstream from the highway bridge. The effluent was ponding near the river bank and had the visual appearance of sewage, as is confirmed by the sample results.

Sample Point No. TP.144.56D

A municipal drainage ditch extends in a northerly direction from Highway 7 near the Regal Stationery Company Limited premises and conducts surface drainage flows to the river. Although no appreciable flow was evident in this ditch on November 3, samples were obtained from liquids which were ponding therein, and the pertinent laboratory results reveal the presence of sewage. Extensive investigations revealed that this ditch can receive flows from various sources. Ditches and surface water conduits on highway property discharge thereto. A sewer which apparently commences in the residential area located at least a block south of the Regal Stationery Company Limited premises extends in a northerly direction under the aforementioned plant and discharges any flows to the drainage ditch. (The stationery firm utilizes a septic tank and tile bed system of apparent adequacy for the disposal of sanitary waste flows.) An inspection of the sewer was made at a manhole located south of the plant and it was evident that, although there was no flow in the sewer at that time, there was visual evidence of sanitary waste accumulations.

Municipal storm sewer outfalls from which no flows were evident on November 3, 1964, have been designated as potential sampling points and are described as follows:

Sample Point No. TP.145.07(W)W

This storm sewer outlet is located on the west bank of the Pigeon River at the south side of Mary Street.

Sample Point No. TP.145.07(E)W

This storm sewer outlet is located on the east bank of the river at the north side of Mary Street.

PROPOSAL CONCERNING WATER AND SEWAGE WORKS

The municipal officials at Omeme have, in the past, contemplated the feasibility of installing public sewage works. On September 10, 1962, a meeting of local officials was attended by Mr. P. G. Cockburn, P. Eng., Assistant District Engineer with this Commission, to discuss the procedures involved in constructing

sewage works. Although no definite plans were formed at that time, Mr. Cockburn advised the officials present that the services of a consulting engineer should be retained to prepare a preliminary engineering report on both water and sewage works. Such a report would serve as a guide for planning with respect to these facilities in the village. Subsequently, the municipal officials decided to abandon their proposals, and the engineering report was not obtained. However, general cost estimates have been received from a consulting firm, with the suggestion that municipal sanitary sewers could be installed to drain to a sewage pumping station located north-west of the Highway 7 bridge. A forcemain would extend from the sewage pumping station to a waste stabilization pond which might be constructed north of the village.

Reportedly, the Ontario Department of Highways intends to widen and re-surface Highway 7 through Omemee during 1965. This proposal has caused concern among local officials who would like to install necessary utilities such as sanitary sewers or water mains before the re-paving programme will be completed.

With respect to the need for water and sewage works in Omemee, it is apparent that only one of these facilities is contemplated at the present time. Sewage disposal problems appear to be most obvious in that part of the village which has experienced the most concentrated development. Coliform organisms were revealed in a substantial number of the private water supplies which were sampled during this survey, indicating that the provision of a safe public water supply is desirable. The usual procedure adopted by municipalities is to install municipal water works prior to sewage works, although in many instances the increased use of water

resulting from the availability of a communal supply tends to overload private sub-surface sewage disposal systems and accelerate the urgency for public sewage works. If a decision should be made to utilize ground water for a public supply, an agreement could be made between the village and the OWRC for a test-drilling programme.

SUMMARY

A water pollution survey of the Village of Omemee was performed by Commission staff on November 2 and 3, 1964, and additional discussions were held with local officials on January 11, 1965. In order to determine the quality of ground and surface waters, samples were collected from private wells. Additional samples were obtained from the waters of the Pigeon River and outfalls discharging thereto.

Since Omemee residents rely on private water supplies and sewage disposal facilities, the local officials had requested this survey by OWRC staff to determine the need for municipal water works and/or sewage works. Although evidence indicates the desirability of installing both facilities, it is probable that only one project will be considered by the local officials at this time. The need for a safe public water supply is apparent. Although chlorination of private water supplies can be undertaken on an individual basis, this procedure could be unreliable if gross pollution is present.

If the provision of public sewage works is not considered, and if remedial measures cannot be provided on a private basis, diligent supervision of water quality at the bathing area is required. The discharging of untreated or inadequately treated sewage flows to a stream can also result in enrichment of the receiving waters with associated effects on aquatic life.

The location of the refuse disposal site serving Omemee is

undesirable from the standpoint of potential pollution of the Pigeon River.

RECOMMENDATIONS

1. The installation of municipal water works should be considered at Omemee. However, such a procedure should not obviate planning for the future construction of sewage works to serve at least the most critical part of the municipality.



2. Relocation of the municipal refuse disposal operation to an appropriate site should receive active consideration.

All of which is respectfully submitted,

District Engineer:


J. K. Theil

Approved by:


K. H. Sharpe, Director 

Prepared by: R. G. Barrens

/mh

TABLE I
GROUND-WATER SUPPLIES

SAMPLE POINT NO. (SHOWN ON MAP)	OWNER OF PREMISES	LOCATION	CHEMICAL ANALYSIS (ALL IN PPM EXCEPT PH)					BACT. EXAMINATION		DATA RE WELLS AS REPORTED BY OWNERS
			HARDNESS AS CaCO_3	ALKALINITY AS CaCO_3	IRON AS FE	CHLORINE AS CL	PH AT LAB.	M.P.N. PER 100 ML TOTAL COLIFORMS	E. COLI	
1	MR. J. GLADDING, SR.	JOHN ST. (WELLINGTON)	--	--	--	--	--	0	0	DRILLED 66 FT.
2	MR. G. HICKS	KING ST. E.	--	--	--	--	--	8.9	0	DRILLED 53 FT.
3	MR. D. DEYELL	KING ST. E.	208	206	3.1	12	7.7	0	0	DRILLED 58 FT.
4	MR. G. STEPHENSON	MARY ST.	192	198	1.05	8	7.7	0	0	DRILLED 60 FT.
5	CANADIAN LEGION HALL	MARY ST. AT MILL ST.	164	200	0.78	8	7.9	0	0	DRILLED 58 FT.
6	MR. J. EVANS	RUTLAND ST.	--	--	--	--	--	15	0	DRILLED 40 FT.
7	SHAW RESEARCH	KING ST.	--	--	--	--	--	0	0	DRILLED 55 FT.
8	COMMUNITY WELL	KING ST.	--	--	--	--	--	8.9	0	DRILLED 27 FT.
9	MR. G. MITCHELL	COLBORNE ST.	--	--	--	--	--	0	0	DRILLED 59 FT.
10	MITCHELL'S HARDWARE	KING ST.	--	--	--	--	--	5	0	DUG 18 FT.
11	MR. P. LATCHFORD	VICTORIA ST.	250	210	10.4	28	7.8	0	0	DRILLED 65 FT.
12	MR. W. WEDLOCK	STURGEON ST.	--	--	--	--	--	39.0	0	DUG 30 FT.
13	PUBLIC SCHOOL	JAMES ST.	236	220	0.61	25	7.7	0	0	DRILLED 87 FT.
14	MR. P. CRAWFORD	MARY ST.	--	--	--	--	--	0	0	DUG 20 FT.
15	MR. W. DOWNING	ENGLISH ST.	--	--	--	--	--	39.0	0	DUG & DRILLED TO 35 FT.
16	MR. M. GALLAGHER	KING ST. W. AT VICTORIA AVE.	200	194	1.75	6	7.7	0	0	DRILLED 35 FT.

TABLE II
PIGEON RIVER

ALL ANALYSES EXCEPT PH REPORTED IN
PPM UNLESS OTHERWISE INDICATED

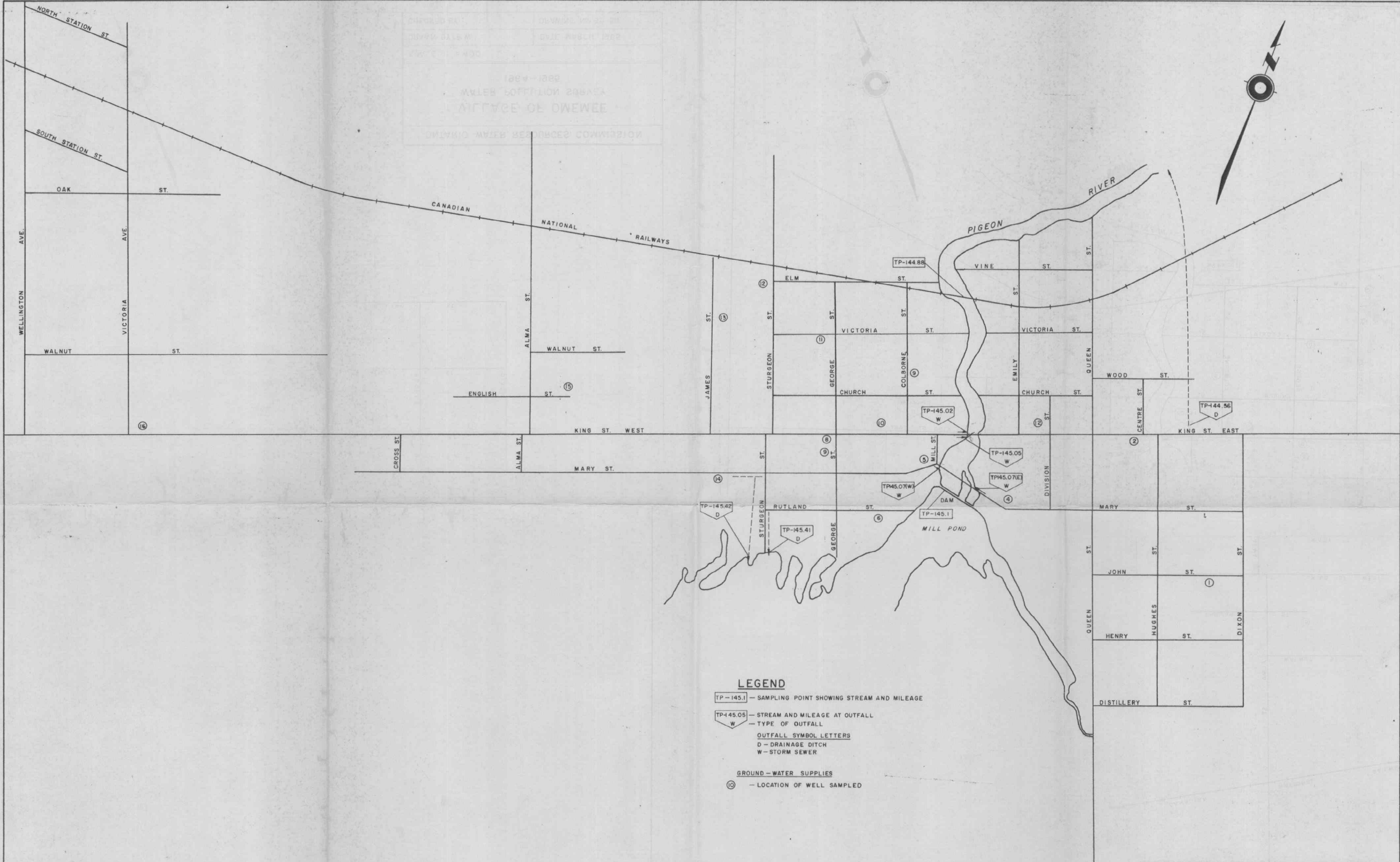
<u>SAMPLE POINT NO.</u>	<u>LOCATION</u>	<u>5-DAY BOD</u>	<u>S O L I D S</u>			<u>ANIONIC DETERGENTS AS ABS</u>	<u>BACTERIOLOGICAL EXAMINATION M.F. COLIFORM COUNT/100 ML</u>
			<u>TOTAL</u>	<u>SUSP.</u>	<u>DISS.</u>		
TP.145.89	PIGEON RIVER AT ROAD UPSTREAM FROM OMEMEE (ABANDONED C.N.R. RIGHT-OF-WAY)	2.2	252	1	251	0.0	620
TP.145.1	PIGEON RIVER AT DAM IN OMEMEE	1.0	228	1	227	0.1	440
TP.144.88	PIGEON RIVER AT C.N.R. TRESTLE NEAR DOWNSTREAM LIMIT OF OMEMEE	1.3	250	1	249	0.1	670

TABLE III

MUNICIPAL OUTFALLS TO PIGEON RIVER IN OMEMEE

ALL ANALYSES EXCEPT PH REPORTED IN
PPM UNLESS OTHERWISE INDICATED

SAMPLE POINT NO.	LOCATION	5-DAY BOD	S O L I D S			BACTERIOLOGICAL EXAMINATION M.F. COLIFORM COUNT/100 ML
			TOTAL	SUSP.	DISS.	
TP.145.42 D	DRAINAGE DITCH EXTENDING FROM MARY ST. TO PIGEON RIVER AT WEST SIDE OF STURGEON STREET.	920.	2186	600	1586	92,000,000
TP.145.07(W)W	STORM SEWER OUTFALL ON WEST BANK OF RIVER AT SOUTH SIDE OF MARY ST.		N O	F L O W		-----
TP.145.07(E)W	STORM SEWER ON EAST BANK OF RIVER AT NORTH SIDE OF MARY ST.		N O	F L O W		-----
TP.145.05 W	STORM SEWER OUTFALL ON WEST BANK OF RIVER AT SOUTH SIDE OF KING ST. (BACT. SAMPLE ONLY)	--	--	--	--	70,000,000
TP.145.02 W	STORM SEWER EFFLUENT PONDING NEAR WEST BANK OF RIVER NORTH OF KING ST.	98.	1045	35	1010	39,000,000
TP.144.56 D	DRAINAGE DITCH EXTENDING IN A NORTHERLY DIRECTION FROM KING ST. (NEAR REGAL STATIONERY CO. LTD. PREMISES) TO PIGEON RIVER	980.	2304	360	1944	190,000,000



LEGEND

- TP-145.1 — SAMPLING POINT SHOWING STREAM AND MILEAGE
- TP-145.05 — STREAM AND MILEAGE AT OUTFALL
- W — TYPE OF OUTFALL
- OUTFALL SYMBOL LETTERS
 - D — DRAINAGE DITCH
 - W — STORM SEWER
- GROUND — WATER SUPPLIES
 - 10 — LOCATION OF WELL SAMPLED

ONTARIO WATER RESOURCES COMMISSION	
VILLAGE OF OMEMEE	
WATER POLLUTION SURVEY	
1964-1965	
SCALE: 1" = 400'	
DRAWN BY: R.W.	DATE: MARCH, 1965
CHECKED BY:	DRAWING No. 65-50